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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,365	10/15/2003	Maximilian Stadler	STADLER ET AL.-3	6715
22045	7590	09/28/2005	EXAMINER	
BROOKS KUSHMAN P.C. 1000 TOWN CENTER TWENTY-SECOND FLOOR SOUTHFIELD, MI 48075			AHMED, SHAMIM	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/686,365

Applicant(s)

STADLER ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 7 is/are rejected.
- 7) ☒ Claim(s) 4-6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of Group I, claims 1-7 in the reply filed on 7/19/05 is acknowledged. The traversal is on the ground(s) that apparatus would not be used with other materials other than silicon, since the etching requires both an oxidant (HNO<sub>3</sub>) and a solubilizer (HF). This is not found persuasive because etching of silicon is an intended use of etching silicon and the apparatus or device is capable of etching other materials as mentioned in the earlier communication.

Further more, the inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

The requirement is still deemed proper and is therefore made FINAL.

***Information Disclosure Statement***

2. The reference of Chandler, Jr. (US 5,843,322) cited in the information disclosure statement (IDS) submitted on 3/15/04 filed on 3/15/04 has been already cited in the IDS filed on 10/15/03. Accordingly, the examiner crosses out the citation of the reference in the information disclosure statement filed on 3/15/04.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by DE-2013830.

The DE-2013830 teaches a process for etching silicon wafers including the steps of preparing an etching bath solution comprises water, nitric acid and hydrofluoric acid and activating the bath by introducing nitrogen oxide ( $\text{NO}_x$ ) such as nitrogen dioxide ( $\text{NO}_2$ ) or dinitrogen tetroxide ( $\text{N}_2\text{O}_4$ ) to the bath, wherein the concentration of the nitrogen oxide is preferable maintained to saturation limit with the accelerated etching rate (see the abstract).

5. Claims 1-3 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwasaki et al (5,266,152).

Iwasaki et al teach a process for etching silicon wafers including the steps of preparing an etching bath solution comprises water, nitric acid and hydrofluoric acid and adding or introducing a desired quantity of nitrite ions, which inherently introduces nitrogen oxide ( $\text{NO}_x$ ) in the etching bath (abstract, col.1, lines 37-47, col.7, lines 1-5).

Iwasaki et al also teach that gaseous nitrogen dioxide ( $\text{NO}_2$ ) is added to produce the nitrite ions in the etching bath containing the mixture of nitric acid and hydrofluoric acid (col.10, lines 16-23).

***Allowable Subject Matter***

6. Claims 4-6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art Yoneya et al (6,444,589) teaches a silicon etching process by applying an etchant containing nitric acid and hydrofluoric acid solution, wherein the etchant is regenerated by pumping out the excess amount of nitrogen oxide (NO<sub>x</sub>) from the recirculation line of the etchant with the help of an inert gas or air (col.6, lines 36-67).

Yoneya et al fail to teach the pumped out nitrogen oxide gas is introducing into a tank, which holds fresh etching solution as the context of claim 4.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Schwab et al (6,610,213), Muraoka et al (3,767,494) and Kaji et al (4,980,017) discloses conventional silicon etching.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed  
Primary Examiner  
Art Unit 1765

SA  
September 24, 2005